



PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or relating to Web Folding and Associating Mechanism for Use with Printing Machines

We, Goss PRINTING PRESS COMPANY LIMITED, a British Company, of Bouverie House, Fleet Street, London, E.C.4, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

10 The present invention relates to a new and useful folding and associating mechanism particularly adapted for use with high speed rotary printing presses.

15 In folding and associating mechanism particularly for high speed rotary web newspaper presses where several webs are associated to form groups which are longitudinally folded by means of formers, and a group of folded, associated webs is guided into association with another group, as in making a cross-associate run, 20 the path of travel of the cross associating group of webs is sharply changed at one or more points in its length. Usually great difficulty is experienced in such runs due to the wrinkling, sagging and irregular running of the group which is being laterally shifted into association with the other group or groups.

25 The present invention has for its object the provision of a novel and improved folding and associating mechanism in which one group of folded webs is efficiently brought by sharp changes in its path of travel to another path and usually into 30 association with another one or more groups of folded webs. A further object is the provision of a novel cross-associating mechanism by which the folded, associated webs from one former may be 35 brought into association with the folded, associated webs, from another former without sagging, irregular running or wrinkling.

40 In accordance with the invention, one or more guide rollers is or are provided for changing the direction of travel of a plurality of longitudinally folded associated paper webs, the or each of the guide rollers comprising a plurality of co-axial 45 contiguous roller sections mounted for relative rotation, one of said sections

engaging the folded portion of the associated webs and another section engaging said webs at their open edge.

50 Preferably one of said sections is secured to a shaft while the other is free thereon. Further, the length of each section may be varied by connecting a number of sections together at each end of the roller.

55 In order that the invention may be clearly understood and readily carried into effect, the same will hereinafter be more fully described with reference to the accompanying drawings, in which:—

60 Figure 1 is a schematic side elevation of a typical and illustrative embodiment of the invention;

65 Figure 2 is a front view of the embodiment shown in Figure 1 showing the associated webs in running position;

70 Figure 3 is a detailed side elevation of one of the roller assemblies used in the embodiment of Figures 1 and 2, with certain parts shown in section;

75 Figure 4 is a detailed side elevation partly in section of a modified form of a roller assembly used in the embodiment of Figures 1 and 2;

80 Figure 5 is an end view of the roller of Figure 4; and

85 Figure 6 is a detailed side view in section of part of the roller assembly of Figure 4 modified in accordance with another feature of the present invention.

90 Referring now to the drawings, the invention is shown as applied to a folding and associating mechanism including a plurality of formers, or longitudinal folders 10, 11 by each of which a group of associated webs is longitudinally folded along the centre line while said webs are drawn over the former and creased by means of one or more pairs of adjacent, driven nipping or drawing rollers 12, one 95 of each pair usually being positively driven. The group of folded associated webs W is then directed to a cutting cylinder, folding cylinder or other means (not shown) by which said group is further 100 treated prior to delivery.

It is often desirable in producing the

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product sharply to change the direction of travel of the group of folded, associated webs, and to associate the group with one or more other groups of folded, associated webs so as to produce a larger product or a product in several sections, as by means of a cross-associate run of the groups of folded webs. Figures 1 and 2 show diagrammatically a typical cross-associate run of the webs from two formers and these groups of webs are associated by sharply changing the direction of travel of one of the groups of webs laterally to shift said group and bring it into contact with the other group just below the drawing rollers 12 of the other former.

For this purpose there is provided one or more guide roller mechanisms 13 over which one group of folded, associated webs passes with its direction sharply changed and according to the present invention each of these roller mechanisms includes a plurality of coaxial, relatively rotatable roller sections of equal diameter, contiguous to each other, and preferably of unequal length, the short section being located to support and guide the folded edge of a folded group of associated webs, while the longer section is in contact with the major width of the web and the open edge thereof, so that the sections may rotate independently as they are driven at different speeds by their contact with the web.

As illustrated, in Figure 3, the roller mechanisms 13 each comprise a shaft 14 on which is fixed or by which is rotatably mounted a roller section 19 which may extend for approximately two-thirds or four-fifths the folded width of the group of webs, while the smaller roller section 15 extends over the remainder of the width of the web. The section 15 is hollow and of the same diameter as the section 19, and is mounted for free rotation on the shaft 14 by means of ball bearings 16 which are suitably held in place against a shoulder 17 on the shaft 14 by a collar 18. The shaft 14, which extends from both ends of the roller mechanism, provides for the mounting of said mechanism in suitable bearings in the press frame so that the roller as a whole is freely rotatable while the sections 15 and 19 are freely relatively rotatable.

As shown particularly in Figure 2, the right-hand web is led from the lower pair of rollers 12 over a first guide roller 13, down to a second guide roller 13 and into contact with another group of folded, associated webs, both groups being then led downwardly to the folding, cutting or delivery means.

The position of the guide rollers 13 may be changed, as desired, for instance, to

lead the left group across and into association with the right group or otherwise.

The roller mechanisms 13, when constructed in the form shown in Figure 3, have the one section 19 which is relatively fixed with respect to the shaft 14 and the section 15 which is relatively movable with respect to the said shaft 14. It is, however, a further feature of this invention to make it possible equally to render the roller section 15 fixed with respect to the shaft 14, and further, to make provision to preselect the relative rotation or immobility of any section of a roller 13 with respect to the shaft 14.

Accordingly, a modified construction of the roller mechanism 13 is provided as shown in Figures 4 and 5. As illustrated, on the shaft 14 there is mounted a plurality of individual roller sections 22, each of these sections being rotatably supported on the shaft by anti-friction bearings 23. Spacer rings 24 keep the respective sections in relative longitudinal position on the shaft 14, while flanged collars 25, threaded on the ends of shaft 14 as at 26, maintain the sections 22 upon the shaft 14, and are locked in place by set-screws 34.

Means are provided to permit the coupling together of any desired number of sections 22 and equally to couple the sections to the shaft 14. To this end, each of the sections 22 is provided with a series of bores 27, these bores being capable of registration with respect to the other sections for the insertion therein of rods 28. Flanges 29 of the collars 25 are also bored with holes 30 adapted to register with the bores 27, and the holes 30 are suitably screw threaded to receive an enlarged threaded portion 31 on the end portion of each rod 28. The rods 28 are provided with heads 32 to assist their insertion into the aligned bores 27 of a succession of sections 22 and to facilitate tightening of the threaded portions 31 in the threaded holes 30.

As illustrated, four bores 27 in sections 22, and four holes 30 in each flange 29, are provided at 90° apart so that two rods 28 may be inserted from either end of the composite roller formed of the sections 22, although a greater or lesser number of bores and holes could be utilized, as required for the particular use of the composite roller.

In order to assist in the ready insertion of rods 28 in bores 27, the ends of each bore in each section 22 may be countersunk, as at 33.

The length of each pair of rods 28 which are used from an end through a flange 29 will govern the number of sections 22 coupled together so that, by pro-

vision of a plurality or groups of rods of different lengths, any desired number of sections 22 may be coupled to the shaft 14 from either end of the shaft, from one section to the maximum number of sections.

Thus, the composite roller made up of sections 22 can function in the same manner as the roller 13 of Figure 3 with the additional advantage that the relative fixed and rotatory portions 19 and 15 of the roller 13 of Figure 3 can in effect be of varying relative lengths, by coupling as many sections 22 together and to the shaft 14 as is desired to make up the fixed portion equivalent to the section 19, the rest of the sections 22 running free upon shaft 14.

Furthermore, if it is desired to attach several sections 22 together without attaching them to the shaft 14, the modified structure shown in Figure 6 can be adapted, where the collar 25 with its flange 29 is removed from the desired shaft end and is replaced by a collar 35 screwed on the same threaded section 26 of the shaft and held by a set screw 36. Rods 28 of suitable length to couple the selected number of sections 22 can then be inserted in the bores 27 and held therein in any desired manner, such as frictionally, which would require no modification of sections 22 or, as illustrated in Figure 6, by tapping an enlarged part of each bore 27 in the end sections 22 only as at 37, and utilizing the threaded enlarged portions 31 of the rods 28, previously employed in conjunction with the threaded holes 30 of flange 29, to engage the threaded section 37 and hold the rods 28 in place.

Thus, by these modifications, there is provided complete control of the relative lengths of the sections 15 and 19 of the rollers 13.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. Web folding and associating mechanism for use with rotary printing

machines, wherein one or more guide rollers is or are provided for changing the direction of travel of a plurality of longitudinally folded associated paper webs, the or each of the guide rollers comprising a plurality of coaxial contiguous roller sections mounted for relative rotation, one of said sections engaging the folded portion of the associated webs and another section engaging said webs at their open edge.

2. Mechanism according to claim 1, wherein the several sections of the or each guide roller are of uniform diameter.

3. Mechanism according to claim 1 or 2 wherein the said roller sections are mounted on a common shaft, one section being secured to said shaft and the other being free thereon.

4. Mechanism according to claim 1 wherein means are provided for connecting together two or more of the roller sections at each end of the roller.

5. Mechanism according to claim 4, wherein each of the roller sections is formed with one or more bores adapted to be brought into register with one another; a rod of appropriate length being inserted within the or each series of aligned bores at opposite ends of the roller.

6. Mechanism according to claim 5, wherein the rod or rods inserted at one end of the roller are secured to the roller shaft, those at the other end of the roller being free from said shaft.

7. Mechanism according to claim 5 or 6, wherein the length of interconnected sections at each end of the shaft is variable by employing connecting rods of different length.

8. Web folding and associating mechanism for use with rotary printing machines substantially as hereinbefore described with reference to the accompanying drawings.

Dated this 22nd day of June, 1945.
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FIG. 1.

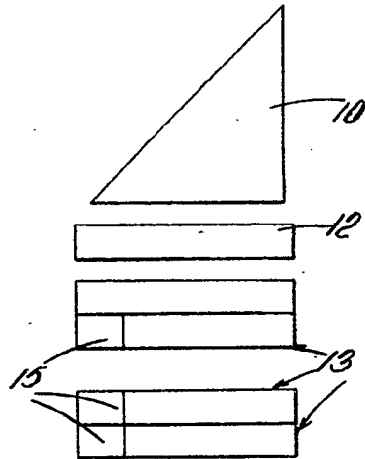


FIG. 2.

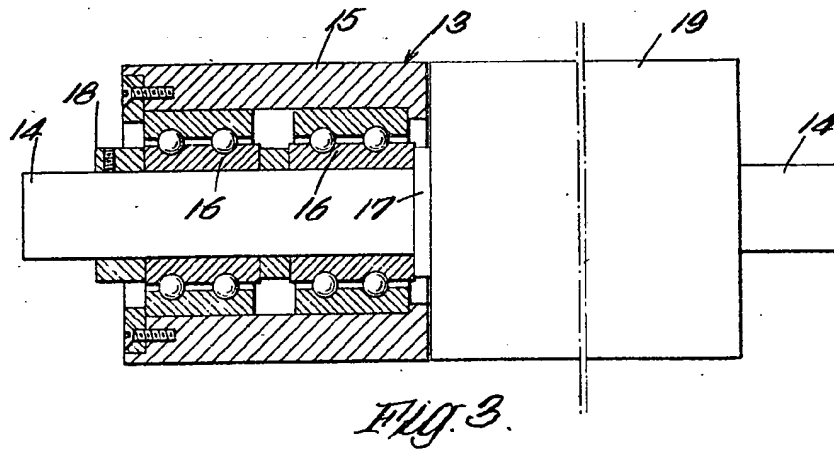
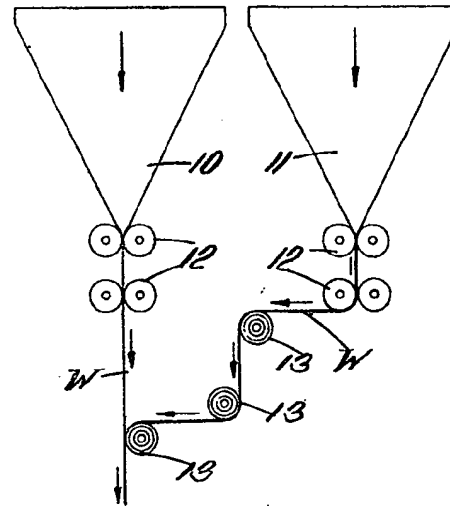
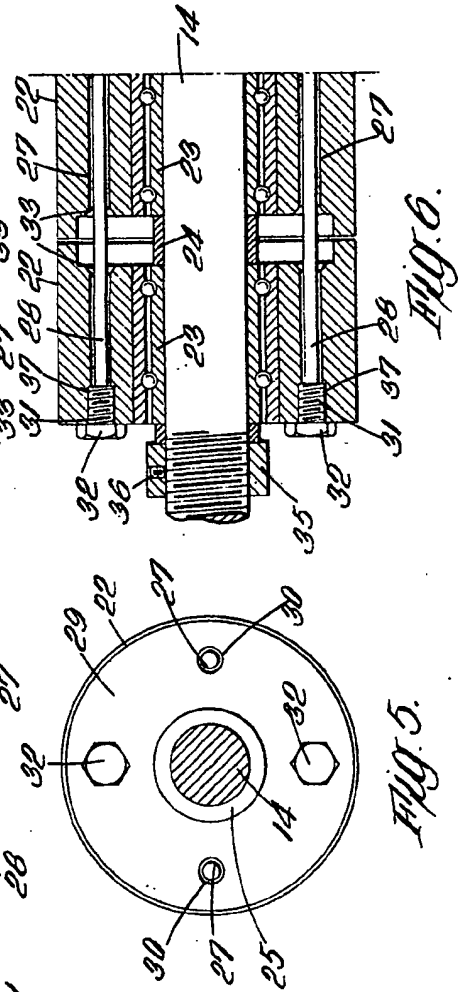
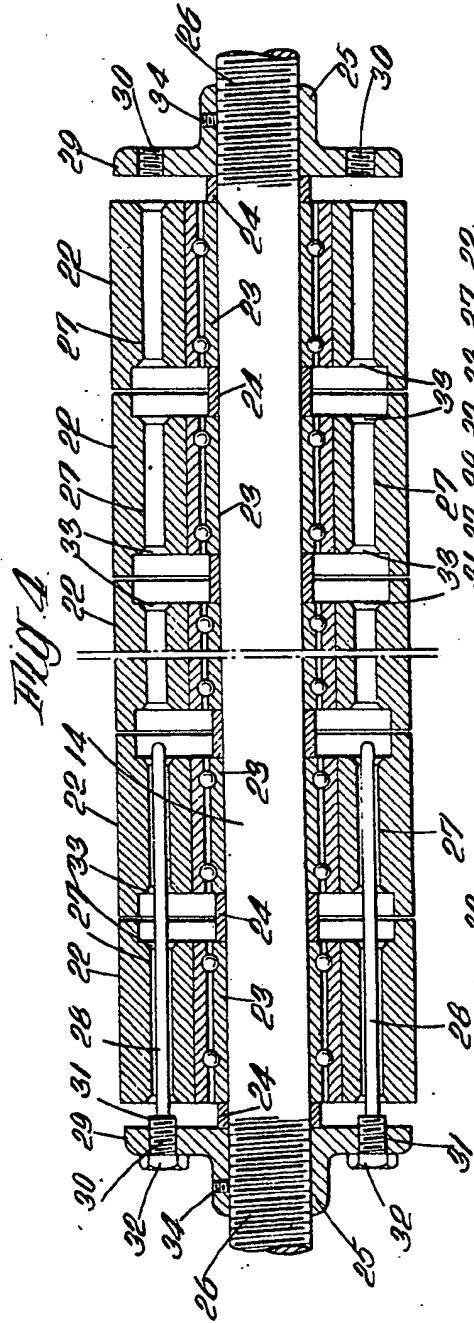


FIG. 3.

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